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FEDERAL COMMUNICATIONS COMMISSION  
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BEFORE THE  
**Federal Communications Commission**  
WASHINGTON, D.C.

In the Matter of

Advanced Television Systems  
and Their Impact Upon the  
Existing Television Broadcast  
Service

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MM Docket No. 87-268

**COMMENTS OF TELE-COMMUNICATIONS, INC.**

**WILLKIE FARR & GALLAGHER**

Three Lafayette Centre  
1155 21st Street, N.W.  
Suite 600  
Washington, D.C. 20036

Its Attorneys

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Tele-Communications, Inc. ("TCI") hereby files its Comments in response to the Commission's Fifth Further Notice of Proposed Rulemaking in the above-captioned proceeding.<sup>1</sup>

**I. INTRODUCTION AND SUMMARY**

In virtually every context in which the Commission has faced a technologically dynamic market, it has decided not to mandate transmission standards. This policy has been particularly pronounced in recent years as the Commission has declined to adopt standards for PCS, DBS, MMDS, and DARS. The Commission should adhere to this approach and not mandate a digital

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<sup>1</sup> In the Matter of Advanced Television Systems and Their Impact Upon Existing Television Broadcast Service, Fifth Further Notice of Proposed Rulemaking, MM Docket No. 87-268, FCC 96-207 (released May 20, 1996) ("Notice").

transmission standard for broadcasters or for any non-broadcast MVPD for the following reasons:

- It is well-established that marketplace forces are simply a superior determinant of technological standards than government.
- Imposition of a digital transmission standard on broadcasters is unnecessary and unjustified, given that the broadcast industry apparently already has voluntarily agreed on a standard.
- Government standard setting is particularly ill advised in markets that are undergoing rapid technological change and in which technology is at the nascent stage of development. In such circumstances, mandatory standards inevitably freeze creativity and innovation, delay the introduction of new technologies and services, impose unnecessary costs on market participants, and create competitive imbalances.
- The multichannel video program distribution ("MVPD") marketplace is undergoing intensely dynamic technological innovation and experimentation, and digital television is at a nascent stage of development. The Commission recently recognized that "many different communications companies are in the midst of deploying new and improved system architectures to increase the bandwidth and efficiency of their distribution facilities."<sup>2</sup> TCI has been at the forefront of digital innovation and experimentation and has committed itself to the most sophisticated and well-established technologies and technical specifications, including MPEG-2 "Main Level, Main

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<sup>2</sup> Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, CS Docket No. 95-61, FCC 95-491 (rel. December 11, 1995), at ¶ 173.

Profile,"<sup>3</sup> which will produce the highest quality digital services for consumers.

- Government imposition of the proposed standard could actually delay the conversion to digital. All television sets today are analog, and the vast majority will continue to be analog for some time. Consumers who wish to receive digital signals using their analog TVs will need a digital-to-analog converter box. If video distributors are afforded maximum flexibility in their choice of digital technologies, they will be able to provide relatively inexpensive digital converter boxes to their subscribers. By contrast, a mandatory digital transmission standard will produce inefficiencies among video distribution networks and increase the costs of the transition to digital for consumers and therefore delay its implementation.
- While the imposition of the ATSC standard is ill advised for both broadcasters and non-broadcast MVPDs, it is especially ill suited for non-broadcast MVPDs. The proposed standard was developed for the broadcast industry. Cable and other MVPDs have distinct physical properties which require different transmission schemes to optimize their networks. TCI and other MVPDs have invested billions of dollars in state-of-the-art digital technologies designed to optimize the benefits of their networks for consumers. This investment, as well as the attendant consumer benefits, would be undermined by a government-imposed digital broadcast standard.

Finally, a mandatory digital transmission standard is particularly unwarranted here because Congress only five months ago passed the Telecommunications Act of 1996 ("1996 Act" or "Act") which compels the Commission to rely on market forces to

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<sup>3</sup> Given that the costs for memory chips has dropped considerably in the last three to six months and that TCI expects this declining cost trend to continue, implementation of MPEG-2 MLMP has become more economical.

establish technical standards. In restricting the Commission's ability to set standards, Congress recognized that "premature or overbroad Government standards may interfere in the market-driven process of standardization in technology driven markets."<sup>4</sup>

**II. THE COMMISSION SHOULD NOT MANDATE A DIGITAL TRANSMISSION STANDARD FOR BROADCASTERS OR NON-BROADCAST MVPDS.**

**A. Reliance on Market Forces is Preferable to Government-Imposed Standards.**

Adoption of a mandatory digital transmission standard for broadcasters and non-broadcast MVPDs would contravene overwhelming economic and historical evidence that market forces are a superior determinant of technical standards. For example, in the PCS and DBS contexts, the Commission declined to establish transmission standards, and vibrant competition and innovation have resulted.

Two divisions of the Federal Trade Commission ("FTC") have impressed upon the Commission the strong economic support for a market-driven approach to standard setting.<sup>5</sup> In recommending

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<sup>4</sup> H.R. Conf. 458, 104th Cong., 2d Sess. 55 (1996) ("Conference Report").

<sup>5</sup> See Comments of the Staff of the Bureau of Economics and the San Francisco Regional Office of the Federal Trade Commission, submitted in Establishment and Regulation of Digital Audio Radio Services, Gen. Docket No. 90-357, January 25, 1991 (published at 1991 FCC LEXIS 638) ("FTC Standards Analysis").

against the adoption of a transmission standard for the DARS industry, the FTC voiced the firm conviction that standards decisions should be left to the market:

The staff believes that the FCC should consider leaving decisions on technological standards to the market. Our conclusion follows from an analysis of the current literature on standard-setting discussed below. In many instances the market will operate to resolve efficiently the standard-setting issues. Furthermore, in those instances where the market will not achieve the efficient result, there is no reason to believe that a regulatory selection will achieve a preferable outcome. Since it is not possible in this context to identify situations in which markets will operate efficiently from those in which it will fail, this suggests that consumers would likely benefit most from a general FCC policy that leaves the determination of standards to the market.<sup>6</sup>

Other analysts have expressed equally steadfast opposition to efforts to manage technological change through government-mandated technical standard setting. For example, a recent white paper by the Alliance to Promote Software Innovation and the Business Software Alliance concluded:

[O]verly broad regulatory standard setting proceedings could create an "aversion" to technological progress and capital formation, thus undermining the incentive of companies to invest in new technologies ....  
[R]egulatory intervention could drastically change today's successful, open, voluntary, marketplace-

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<sup>6</sup> Id. at 32. The FTC Standards Analysis should be accorded considerable weight in this context given the FTC's responsibility for maintaining competition and safeguarding consumer interests, as well as its expertise on matters concerning the selection of technological standards. See id. at n.7 (identifying those FCC proceedings in which the FTC has submitted comments on the selection of technological standards).

driven, private-sector-led, consensus standards, development process in the technology critical for the successful development of the information marketplace.<sup>7</sup>

As these expert bodies have concluded, marketplace forces are simply a better and more efficient arbiter of technical standards.

**B. Government Imposition of a Digital Transmission Standard on Broadcasters is Unnecessary and Unjustified, Given the Industry Consensus on a Digital Broadcast Standard.**

The Commission has consistently recognized that it should not consider imposing a mandatory standard unless two conditions are present: 1) a general inability of the market to agree on de facto standards; and 2) evidence that mandatory standards are necessary to secure the public benefits of compatibility and certainty.<sup>8</sup> For example, the Commission has repeatedly rejected proposals to mandate a single encryption standard for C-Band satellite cable programming, largely because a de facto standard already exists in the marketplace.<sup>9</sup> Similarly, in its recent

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<sup>7</sup> The Information Marketplace: The Perspective of the Software and Computer Industry, Special Focus Paper, Spring 1995, at 11.

<sup>8</sup> See Notice at ¶ 31. See also Stanley M. Besen and Garth Saloner, "The Economics of Telecommunications Standards" in Changing the Rules: Technological Change, International Competition, and Regulation in Communications, Robert W. Crandall and Kenneth Flamm, editors (The Brookings Institute, 1989) ("Besen and Saloner").

<sup>9</sup> See In the Matter of Inquiry into the Need for a Universal Encryption Standard for Satellite Cable Programming, Report,

(continued ...)



Number Portability Order, the Commission declined to mandate a specific long-term number portability technology solution for the industry, opting instead to rely on industry efforts. Among the reasons cited by the Commission for this deferral to the marketplace were the following:

- (1) since there is "sufficient momentum to deploy compatible methods, if not an identical method, nationwide ... mandating the implementation of a particular number portability architecture, or mandating that the same architecture be deployed nationwide, appears unnecessary;"
- (2) such a government mandate might actually delay the implementation of number portability; and
- (3) "dictating implementation of a particular method could foreclose the ability of carriers to improve on those methods already being deployed or to implement hybrid (but compatible) methods."<sup>10</sup>

As the Notice points out, there already exists a "strong industry coalescence around the ATSC DTV standard."<sup>11</sup> As the Besen and Saloner analysis demonstrates, the consensus around the

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(... continued)

5 F.C.C.R. 2710, at ¶ 70 (1990) ("Our examination of the record convinces us that the VC II system remains the de facto industry standard, so consumers need not purchase multiple decoders. ... [W]e do not wish to constrain the development of new services and technologies by adopting a satellite cable programming encryption standard at a time when one system is so widely used by programmers.").

<sup>10</sup> In the Matter of Telephone Number Portability, First Report and Order and Further Notice of Proposed Rulemaking, CC Docket No. 95-116, FCC 96-286 (released July 2, 1996), at ¶ 46.

<sup>11</sup> Notice at ¶ 27.

digital broadcast standard eliminates any argument that "private industry will not, or cannot, produce a standard because the private costs of getting involved in standard setting outweigh the private benefits," or that "private industry cannot agree which should become the standard."<sup>12</sup> Moreover, given the marketplace agreement on a digital broadcast standard, there is a strong likelihood that other technologies will find efficient ways to achieve compatibility.<sup>13</sup> Cable operators and other MVPDs have a clear incentive to develop a method for delivering broadcast services which its customers value. In such circumstances, government intervention to mandate industry standards is simply unwarranted.<sup>14</sup>

**C. Government Standards Are Particularly Ill Advised in Highly Dynamic and Evolving Markets.**

Government standards are particularly damaging when imposed upon industries undergoing a high level of technological and

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<sup>12</sup> See id. at ¶ 31.

<sup>13</sup> See Stanley M. Besen and Leland L. Johnson, Compatibility Standards, Competition, and Innovation in the Broadcasting Industry, Rand Corporation, November 1986, at viii ("Rand Compatibility Study") (where one technology is clearly preferred by all, industry members and consumers can be certain that other products will emulate the preferred model).

<sup>14</sup> See FTC Standards Analysis at 32 (without evidence that the market will fail in its ability to set the most efficient standard, government intervention to mandate a standard is unwarranted).

competitive change or where the technology is at a nascent stage of development. Under such marketplace conditions, government-imposed standards freeze the current level of technology and stifle development of new technologies. Stated another way, the premature adoption of a standard is especially likely when technology is changing rapidly, so that government decision-makers, although they possess the power to establish a standard, necessarily lack sufficient information to do so adequately.<sup>15</sup> In these circumstances, premature standardization would prevent the experimentation that would lead to improved information about the advantages of various technological alternatives.<sup>16</sup>

These economic realities have been consistently recognized by both the Commission and other experts. For example, Drs. Stanley M. Besen and Leland L. Johnson, two prominent experts on technological standards, have long argued that, when industry is

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<sup>15</sup> One analyst refers to this as the "Blind Giant Quandary." See P.A. David, "Some New Standards for the Economics of Standardization in the Information Age," in P. Dasgupta and P. Stoneman (editors), Economic Policy and Technological Performance, Cambridge: Cambridge University Press, 1987, p. 230. The Quandary is "the dilemma posed by the fact that public agencies are likely to be at their most powerful in exercising influence upon the future trajectory of a network technology just when they know least about what should be done." Id.

<sup>16</sup> David prescribes as one of the "positive actions" a government agency should pursue "is to gather more information about technological opportunities even at the cost of immediate losses in operations efficiency." Id.

in a period of high innovation and volatility, the likelihood that a government standard will result in inefficient and/or artificial technological decisions is particularly acute.<sup>17</sup> Thus, formal standard-setting in rapidly changing industries should always be avoided.<sup>18</sup> When the technology "settles down," the advantages of standards will present themselves, resulting in de facto standards being established by the market or industry bodies.<sup>19</sup> As Besen and Johnson conclude:

[T]he government should refrain from attempting to mandate or evaluate standards when the technologies themselves are subject to rapid change. A major reason for the Commission's difficulty in establishing the first color television standard was the fact that competing technologies were undergoing rapid change even during the Commission's deliberations. It is only after the technologies have "settled down" that government action is most likely to be fruitful, as illustrated in the TV stereo case.<sup>20</sup>

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<sup>17</sup> See Rand Compatibility Study at 94 ("the dangers of premature standard-setting are especially great if significant refinements are taking place").

<sup>18</sup> Id. at ix.

<sup>19</sup> For example, the cable TV channel plan was developed by the cable and consumer electronics industries cooperatively in the EIA/NCTA Joint Engineering Committee and implemented in both industries at essentially the same time.

<sup>20</sup> Rand Compatibility Study at 135. See also EIA and TIA White Paper on National Information Infrastructure, 1994, at 9 ("In areas of rapidly changing technology, premature adoption of a standard can impede innovation"); The Information Marketplace: The Perspective of the Software and Computer Industry, Special Focus Paper, Spring 1995, at 11 ("[S]etting standards too early in the development of the information marketplace would lock us into technologies which ultimately will retard the efficient

(continued ...)

A recent controversy illustrates the fact that a government-mandated DTV standard could seriously impede technological innovation. Although the broadcasting industry has reached general consensus on a DTV standard, already the computer industry has raised a significant concern about the standard's inclusion of an interlaced scanning system option, as opposed to the exclusive use of a progressive scanning system.<sup>21</sup> Even the chairman of the ATSC has acknowledged that an exclusive progressive scanning system would be a beneficial refinement to the ATSC DTV standard.<sup>22</sup> Until recently, it was believed that the manufacture of a progressive-scan HDTV camera that could run at 60 frames per second was impossible. Then, Polaroid Corp. introduced such a camera, demonstrating once again that technological innovation in the video marketplace consistently

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(... continued)  
evolution and use of these networks"); Peter Pitsch and David C. Murray, "A New Vision for Digital Telecommunications," A Briefing Paper, No. 171, The Competitiveness Center of the Hudson Institute, Indianapolis, IN, December 1994, at 2 ("[G]overnment is ill-equipped to regulate tightly a fast-paced environment characterized by rapid technological change and continuous innovation in services. If it tries, its efforts will almost certainly backfire").

<sup>21</sup> See "Computer Firms Angle for HDTV Input," Video Technology News, June 17, 1996.

<sup>22</sup> Id. (quoting ATSC Chairman, Richard Wiley, as stating "We always said that the system should migrate to all-progressive scanning").

exceeds expectations.<sup>23</sup> However, a mandatory digital transmission standard which incorporates an interlaced scanning system arguably will prevent (or at the very least substantially delay) the full transition to progressive scan, with its higher spectrum efficiency, superior rendition of detail and motion, easier transcoding to other formats, and enhanced computer-friendliness.<sup>24</sup> This is exactly why the Commission should not mandate a digital transmission standard. Rather, the Commission should allow the progressive scanning method and other such innovations to receive their proper consideration in the marketplace.<sup>25</sup>

Moreover, changing a government standard to accommodate innovations is a particularly time-consuming process. When a standard is imposed prematurely by government, it is difficult for superior technologies to displace those that are embodied in

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<sup>23</sup> See "Polaroid HDTV Camera: Meeting a New Standard," New Technology Week, May 13, 1996.

<sup>24</sup> See Ex Parte Letter from William F. Schreiber to Chairman Hundt in MM Docket No. 87-268, filed on May 9, 1996.

<sup>25</sup> Of course, another example of the potentially serious implications of government standard-setting in this area is the fact that an unexpected turning point in the Commission's approach to ATV has occurred once in the development process with the demonstration of the viability of an all-digital system. Had the government set an ATV standard prior to this important development, the industry and American leadership would have been significantly harmed.

the standard. For example, the Commission took over two years to amend its rules to accommodate ISDN technology.<sup>26</sup> This period is typical of the amount of time it takes for the Commission to change a mandated technical standard. In some cases, the delay is considerably longer, as it was with adoption of the color TV standard which took over four years. Of course, such delays are inconsistent with the rapid pace of technological development that characterizes the video distribution marketplace.<sup>27</sup> The Commission recognized this drawback and acknowledged that it "could reduce the incentive to conduct the research and development that leads to innovation."<sup>28</sup>

The lesson of the personal computer ("PC") industry further demonstrates the benefits of allowing the marketplace to establish standards in progressive and dynamic industries. During the past decade, the American PC industry has dominated the worldwide market. Market forces have successfully generated the necessary de facto standards and critical interfaces required

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<sup>26</sup> See ISDN Order, 11 F.C.C.R. 5091 (1996).

<sup>27</sup> For a real-world comparison, consider how this protracted administrative process for changing government-mandated standards would impact the PC chip market which today, unconstrained by government standards, typically produces new generations of chips and innovative designs every six months.

<sup>28</sup> Notice at ¶ 42. In fact, this is precisely why very few innovations have been implemented in the NTSC transmission standard. Id. at ¶ 34.

to achieve compatibility while not impeding innovation. The Commission wisely encouraged this growth by refraining from imposing technical standards or any other form of restrictive regulation. The Commission also adopted this market-based approach in the licensing of PCS spectrum, concluding that the rapid technological change in PCS development demanded a flexible regulatory approach to technical standards:

[M]ost parties recognize that PCS is at a nascent stage in its development and that imposition of a rigid technical framework at this time may stifle the introduction of important new technology. We agree, and find that the flexible approach toward PCS standards that we are adopting is the most appropriate approach.<sup>29</sup>

This decision has fostered vigorous innovation and competition among vying PCS transmission schemes.<sup>30</sup>

**D. The Highly Dynamic MVPD Marketplace and the Nascent Stage of Development of Digital Television Make a Government-Mandated Digital Transmission Standard Particularly Inappropriate At This Time.**

The 1996 Act both recognized and amplified the most dynamic period in the history of telecommunications. As a result of the Act, telecommunications companies are entering an era of convergence in which new markets are being opened, new

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<sup>29</sup> PCS Second Report and Order, Gen. Docket 90-314, FCC 93-451 (released October 23, 1993), at ¶ 137.

<sup>30</sup> See, e.g., "CDMA Wins Major Backer in Bells' PCS Primeco," Multichannel News, June 12, 1995, at 1A.



technologies are being implemented, and new services are being introduced. As the President said upon signing the 1996 Act:

This law is truly revolutionary legislation that will bring the future to our doorstep. ... Already the revolution is so profound that it is changing the dominant economic model of the age. ... Today, with the stroke of a pen, our laws will catch up with our future. [The 1996 Act] will help create an open marketplace where competition and innovation can move as quick as light.<sup>31</sup>

Technological innovation in the MVPD marketplace is unprecedented. As Congress noted, there has been a veritable "explosion of video distribution technologies."<sup>32</sup> For example, various cable operators have made substantial investments in digital technology and are currently experimenting with diverse network topologies for delivering interactive digital TV.<sup>33</sup> DBS operators have already launched digital video systems and sold over two million digital satellite receivers to consumers. Telcos continue to explore various video platforms, including Asymmetric Digital Subscriber Line, hybrid fiber-coax, or switched digital video. MMDS operators will soon implement

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<sup>31</sup> "Remarks By The President In Signing Ceremony For the Telecommunications Conference Report," White House Press Release, February 8, 1996.

<sup>32</sup> H.R. Rep. 204, 104th Cong., 1st Sess. 55 (1995) ("House Report").

<sup>33</sup> See "Tech Debate Blurs Digital Agenda," Multichannel News, June 12, 1995, at 1A.

digital compression in their systems. Each of these industries has invested significantly in research and development efforts, and many have undertaken costly market trials to test consumer demand for innovative digital services.<sup>34</sup>

The level of dynamism in the broadcast industry is likely to increase as well. Broadcasters are already preparing to use new digital spectrum to deliver innovative services. As the Notice correctly points out, "Digital broadcasting is in its infancy, and further advances are likely to occur."<sup>35</sup> Chairman Hundt recently described the transformation in the broadcasting industry that will be triggered by the implementation of digital technology:

The new digital transmission of broadcast will be capable of many new wondrous services. With one misnamed "channel" of six megahertz of spectrum, a tower here in Nashville could broadcast to every PC, telephone, computer, and television, in the city simultaneously four or five TV shows, and a couple of software programs, and a newspaper, and a phone book, and movies for storage in the VCR (if VCRs still exist). ... The digital transmission technology is so supple and flexible that the possibilities of serving the public interest are staggering. And the commercial possibilities are beyond the dreams of avarice.<sup>36</sup>

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<sup>34</sup> See "Go Digital," Cablevision, May 22, 1995, at 39-50. See also "Server Vendors Eye Compatibility Issues" and "Ventura To Test Two-Way TV," Interactive Age, April 10, 1995, at 42.

<sup>35</sup> Notice at ¶ 33.

<sup>36</sup> Speech by Reed Hundt, Chairman, Federal Communications Commission, Before the Industry Leadership Conference Information Technology Association of America, Nashville, Tennessee, October 9, 1995, at 4.

TCI has been at the forefront of the digital video revolution. Most importantly, TCI has ordered more than one million digital home terminals and plans to launch digital TV later this year, beginning with the wide-scale deployment of near-video-on-demand and other digital services. TCI has worked closely with CableLabs and other industry organizations and standard-setting groups, both nationally and internationally, over the last seven years defining, analyzing, testing, and re-testing various elements of digital video. In addition, TCI has committed to state-of-the-art digital video specifications, including MPEG-2 "Main Level, Main Profile." In fact, while MPEG-2 leaves much in the system component area undefined (such as treatment of the vertical blanking interval, closed captioning information, and the "system information" description<sup>37</sup>), TCI has spearheaded cable industry efforts to reach a consensus on a robust set of system component parameters. These parameters have been approved by the cable industry and filed with the ITU. In short, TCI has actively participated in every available process to bring digital technology to consumers under the most

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<sup>37</sup> The system information description (or "SI tables") incorporates the necessary information to enable not only broadcast television, audio, and data services, but also the necessary extensions to support the implementation of interactive services.

expeditious timeframe possible and has adopted the most sophisticated and well-established technologies and technical specifications which will produce the highest quality digital services. TCI will continue to work within all available industry processes and organizations and to cooperate with the MVPD marketplace as this marketplace develops and as innovation in the digital arena ushers in still better technologies and technical specifications.

In short, the video distribution marketplace is currently evolving at a rapid pace, and digital video technology is at the incipient stages of development. Under such circumstances, the imposition by government of a digital video transmission standard is particularly ill advised.

**E. Government-Imposition of a Digital Transmission Standard Will Delay the Conversion to Digital.**

Allowing all video distributors to optimize the use of digital technology for their networks unencumbered by government standard setting will promote the conversion to digital technology. Broadcasters and MVPDs will continue to have to accommodate their installed base of analog subscribers. Approximately 282,610,000 analog TVs are deployed in the United States,<sup>38</sup> and approximately 28 million more are purchased every

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<sup>38</sup> See TV and Cable Factbook No. 64, 1996 Edition, at B-376.

year.<sup>39</sup> These analog TVs, which typically have a useful life upwards of 15 years,<sup>40</sup> will require a converter box to receive digital services. The conversion to digital will be substantially streamlined if all video distributors are afforded maximum flexibility to implement digital services in the most efficient and cost-effective manner possible.

Supporters of government-imposition of a digital transmission standard contend that the existence of a single mandated standard will speed the penetration of digital receivers, especially those that are capable of receiving High Definition Television signals. According to this argument, consumers are more likely to defer purchases of new receivers, or purchase non-digital receivers, if they are uncertain which of a number of competing digital transmission technologies is likely to emerge as the standard because they fear being "stranded" with the "wrong" technology. In this view, the "network externalities" associated with increased penetration justify imposition of a standard.

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<sup>39</sup> See Broadcasting and Cable Yearbook, 1996, at C-243.

<sup>40</sup> In fact, the useful life of analog TVs will be prolonged due to the Commission's decision to require the simulcast of analog broadcast signals.

Although this argument may have merit in some circumstances,<sup>41</sup> it is not relevant in this situation. Even if different transmission standards are employed, for example, by broadcasters and cable operators, if all new digital receivers can receive both broadcast and cable digital transmissions,<sup>42</sup> or if subscribers can use set-top boxes to receive cable transmissions, they need not be concerned about being stranded.

In effect, the set-top box provides cable subscribers with a perfect "translation" of signals that are transmitted using a different broadcast standard. The "network externality" argument fails here because, when translators work perfectly, all viewers -- whether they receive broadcast signals over-the-air or via cable -- are effectively part of the same network. Thus, the willingness of cable subscribers to purchase new digital receivers will not be adversely affected.

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<sup>41</sup> See P.H. Dybvig and C.S. Spatt, "Adoption Externalities as Public Goods," Journal of Public Economics, Vol. 20, pp. 231-247, 1983 and J. Farrell and G. Saloner, "Standardization, Compatibility, and Innovation," Rand Journal of Economics, Vol. 16, pp. 70-80, 1985, for models in which the benefits from adopting a particular technology depend on the number of others who have done so, or are expected to do so, so that the willingness of consumers to adopt a particular technology depend on their assessment of the size of the network they expect to be joining.

<sup>42</sup> We note that CableLabs has patented a hybrid VSB-QAM demodulator that could be built into digital TV receivers for an incremental cost of approximately \$15.

**F. The Proposed Digital Broadcast Standard is Especially Ill Suited for Cable and Other Non-Broadcast MVPDs.**

While the proposed ATSC standard should not be imposed on broadcasters or non-broadcast MVPDs for the reasons discussed above, the standard is especially ill suited for non-broadcast MVPDs. The ATSC standard was conceived for broadcasters and has been optimized for broadcasters. The Commission acknowledges this fact in the Notice:

The ATSC DTV Standard has been optimized for terrestrial digital television delivery, where channel bandwidth is limited and transmission errors and data loss are likely.<sup>43</sup>

In fact, as a matter of physics, it would be impossible to design a digital standard that is optimal -- or even workable -- with all MVPD technologies. Due to the inherent differences in the media over which they transmit signals, MVPDs typically use different modulation/transmission schemes to optimize transmission. For example, satellite networks, such as DBS, use QPSK modulation, while the cable industry has selected QAM as its digital modulation standard. The ATSC proposal recommends a VSB modulation standard. This diversity of modulation methods is a function of the physics of each transmission medium. Thus, the Commission simply cannot mandate the digital broadcast standard

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<sup>43</sup> Notice at ¶ 15.

for MVPDs without seriously threatening the efficiency of each unique transmission medium.

**G. The 1996 Act and Commission Precedent Preclude the Commission from Imposing a Digital Transmission Standard.**

A guiding principle of the 1996 Act was to "to accelerate rapidly private sector deployment of advanced telecommunications and information technologies,"<sup>44</sup> and Congress recognized that this could best be achieved by "minimizing government limitations on the commercial use of those technologies."<sup>45</sup>

One of the most prevalent manifestations of this policy is Congress' universal disfavor of any form of government standard-setting which might stifle innovation or competition.<sup>46</sup> For example, in Section 301(e) of the 1996 Act, Congress banned state and local imposition of cable technical standards because complying with such standards would be "particularly inappropriate in today's intensely dynamic technological environment."<sup>47</sup> Similar caution was used in adopting Section 304 of the 1996 Act regarding the commercial availability of

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<sup>44</sup> Conference Report at 1.

<sup>45</sup> S. 652, 104th Cong., 1st Sess. § 3(5) (1995).

<sup>46</sup> See, e.g., 47 U.S.C. §§ 544A(a)(4), (c)(2)(D); 47 U.S.C. § 544(e).

<sup>47</sup> House Report at 110.



navigation devices. While Section 304 grants the Commission authority to assure the commercial availability of customer equipment, it requires the Commission to "avoid actions which could have the effect of freezing or chilling the development of new technologies and services."<sup>48</sup>

In the regulation of telephony services, Congress showed an equally strong desire to avoid government standard-setting. Although Congress found strict interconnection standards necessary for the introduction of local telephony competition, it nonetheless specifically prohibited the extension of any such standards "to telephone equipment or other CPE."<sup>49</sup> As with cable equipment, Congress found that "[a]llowing the Commission to establish standards ... would have the effect of freezing technology, slowing innovation, and limiting the development of new features and capabilities."<sup>50</sup>

It is impossible to read the 1996 Act in its totality without concluding that Congress intended the Commission to avoid standard setting which might impede technological innovation. Government imposition of the proposed ATSC standard -- which is a comprehensive, five-layered standard dictating every aspect of

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<sup>48</sup> Conference Report at 181.

<sup>49</sup> House Report at 83.

<sup>50</sup> Id.